CLAIMS

What is claimed is:

1. A method of positioning components on a support structure comprising the step of causing position changes by modifying at least a portion of the material of the support structure by inducing at least one of:

a density change and

an internal stress change.

2. The method of claim 1 wherein the density change is the result of at least one of:

a change in the crystal structure;

a change in the ratio of crystalline to non-crystalline material;

a change in chemical composition;

a change in chemical composition profile; and

a change in microstructure.

3. The method of claim 1 wherein the internal stress change is the result of at least one of:

a change in the crystal structure;

a change in the ratio of crystalline to non-crystalline material;

a change in chemical composition;

a change in chemical composition profile;

addition of material;

removal of material; and

a change in microstructure.

4. The method of claim 1 wherein modifying at least a portion of the material comprises application of an amount of energy.

5. The method of claim 4 wherein the energy comprises at least one of mechanical energy, electrical energy, chemical energy, electromagnetic energy, and laser energy.

6. The method of claim 4 wherein the amount of energy comprises at least one pulse of laser energy.

7. The method of claim 4 wherein the material of the support structure comprises at least one of metal, metal alloy, ceramic, polymer, and composite material.

8. The method of claim 1 wherein the internal stress change results from at least one of an addition of a dissimilar material to a surface of the support structure, an ion implantation of the support structure with an amount of a material.

9. The method of claim 1 wherein the support structure comprises at least two dissimilar materials and the internal stress change results from the removal of an amount of at least one of the dissimilar materials.

10. A method of alignment and assembly of optical components, at least one of the optical components having an associated support structure, the method comprising the steps of:

a) monitoring the optical coupling efficiency for the optical components;

b) causing position changes of the at least one optical component in response to the coupling efficiency by modifying at least a portion of the material of the support structure by inducing at least one of density change, internal stress, and microstructure change to move the at least one optical component so as to achieve a substantially optimum optical coupling efficiency.

11. The method of claim 10 wherein the density change is the result of at least one of:

a change in the crystal structure;

a change in the ratio of crystalline to non-crystalline material;

a change in chemical composition; and

a change in chemical composition profile and

a change in microstructure.

12. The method of claim 10 wherein the internal stress change is the result of at least one of:

a change in the crystal structure;

a change in the ratio of crystalline to non-crystalline material;

a change in chemical composition;

a change in chemical composition profile;

addition of material; and

removal of material and

a change in microstructure.

13. An optoelectronic package comprising:

at least two optical components; and

at least one support structure;

one of the optical components being supported by the support structure wherein the optical alignment of the optical components has been effected through changes in a dimension of the support structure by modifying at least a portion of the material of the support structure by inducing at least one of:

a density change,
an internal stress change, and
a microstructure change.

14. The device of claim 13 wherein the dimension change results from at least one of:

an application of an amount of energy to the support structure and

an ion implantation of the support structure with an amount of a material.

15. The device of claim 13 wherein the dimension change results from the application of at least one chemical element to the support structure.

16. A method of positioning components on a support structure comprising the step of causing position changes by modifying the density of at least a portion of the material of the support structure.

17. The method of claim 16 wherein modifying the density comprises inducing a change in crystalline phase.

18. The method of claim 16 wherein modifying the density comprises inducing a change in chemical composition.

19. The method of claim 16 wherein modifying the density comprises inducing a change in microstructure.

20. The method of claim 17 wherein inducing the change in crystalline phase comprises application of an amount of energy to the support structure.

21. An optical package for use in producing an optically aligned optical package comprising:

at least two optical components; and

at least one support structure;

one of the optical components being supported by the support structure, the support structure comprising a material capable of undergoing crystalline phase changes that cause position changes for the optical component supported by the support structure.

22. The optical package of claim 21 wherein the support structure material comprises at least one of metal, metal alloy, ceramic, polymer, and composite material.

23. The optical package of claim 21 wherein the support structure material is capable of undergoing phase changes in response to the application of energy.

24. An optical apparatus comprising:

at least two optical components; and

at least one support structure;

one of the optical components being supported by the support structure, at least a portion of the support structure having an induced density variation for optical alignment of the optical components.

25. An optical package comprising: at least one optical component and means for positioning the at least one optical component.

26. A system for aligning optical components comprising:

means for monitoring the optical coupling efficiency for the optical components; and

means for changing the relative position of at least one optical component with respect to a least one other optical component in response to the monitored coupling efficiency.

27. A method of positioning optical components on a support structure comprising the step of causing position changes by inducing a dimension change in at least a portion of the material of the support structure.

28. The method of claim 27 wherein the dimension change is the result of at least one of:

a change in the crystal structure;

a change in the ratio of crystalline to non-crystalline material;

a change in density;

a change in chemical composition;

a change in chemical composition profile; and

a change in microstructure.

29. The method of claim 27 wherein inducing the dimension change comprises application of an amount of energy.

30. The method of claim 29 wherein the energy comprises at least one of mechanical energy, electrical energy, chemical energy, electromagnetic energy, and laser energy.

31. The method of claim 29 wherein the amount of energy comprises at least one pulse of laser energy.

32. The method of claim 29 wherein the material of the support structure comprises at least one of metal, metal alloy, ceramic, polymer, and composite material.

33. A method of alignment and assembly of optical components, at least one of the optical components having an associated support structure, the method comprising the steps of:

a) monitoring the optical coupling efficiency for the optical components;

b) causing position changes of the at least one optical component in response to the coupling efficiency by inducing a dimension change in at least a portion of the material of the support structure by creating at least one of a change in crystal structure, a change in the ratio of crystalline to non-crystalline material, a change in density, a change in chemical composition, a change in microstructure, and a change in chemical composition profile to move the at least one optical component so as to achieve a substantially optimum optical coupling efficiency.

34. An optoelectronic device comprising:

at least two optical components; and

at least one support structure;

one of the optical components being supported by the support structure wherein the optical alignment of the optical components has been effected through changes in a dimension of the support structure by modifying at least a portion of the material of the support structure by inducing at least one of a phase change and a microstructure change.

35. The device of claim 34 wherein the phase change results from the application of an amount of energy to the support structure.

36. The device of claim 34 wherein the changes in the dimensions of the support structure results from the application of at least one chemical element to the support structure.